

The whip spider collection (Arachnida, Amblypygi) held in the Natural History Museum Vienna, Austria

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Abstract. We present data and remarks on the history and contents of the whip spider collection housed in the Natural History Museum of Vienna, Austria. The collection comprises a total of 167 specimens from 4 families, 10 genera and 27 species. It includes types of four species: *Charinus ioanniticus* (Kritscher, 1959), *Damon brachialis* Weygoldt, 1999, *Phrynus parvulus* (Pocock, 1902) and *Paraphrynus mexicanus* (Bilimek, 1867). Short notes on interesting objects and former curators are provided as well as an appendix with a list of species kept alive by Michael Seiter.

Keywords: museum's collection history, NHMW, Reimoser, small arachnid order

Zusammenfassung. Die Geißelspinnensammlung (Arachnida, Amblypygi) des Naturhistorischen Museums Wien, Österreich. Wir präsentieren Daten und Anmerkungen zur Geschichte und dem Inhalt der Geißelspinnensammlung des Naturhistorischen Museums Wien, Österreich. Die Sammlung umfasst 167 Individuen aus 4 Familien, 10 Gattungen und 27 Arten und beinhaltet Typen von vier Arten: *Charinus ioanniticus* (Kritscher, 1959), *Damon brachialis* Weygoldt, 1999, *Phrynus parvulus* (Pocock, 1902) und *Paraphrynus mexicanus* (Bilimek, 1867). Die Angaben werden durch kurze Anmerkungen zu interessanten Objekten und früheren Kuratoren sowie einem Appendix mit der Liste der von Michael Seiter lebend gehaltenen Arten ergänzt.

Amblypygi, or so-called whip spiders, (order Arachnida) are tropical to subtropical organisms with special morphological traits among the arachnids. They are characterised by their dorso-ventrally flattened body and strong, raptorial pedipalps armed with spines. The first legs are extremely elongated and antenniform. These legs are very important during mating, hunting and antagonistic behaviour (Weygoldt 2000). According to Prendini (2011) recent Amblypygi currently include 5 families, 17 genera and 161 species; however Blick & Harvey (2011) mentioned 171 species, Seiter (2011) tallied 174 species and Harvey (2013) listed 186 species.

Worldwide, only a few scientists have recently worked regularly on whip spiders (e.g. Weygoldt 2000, 2002, Harvey 2003, 2007). Some studies focused on parthenogenesis (de Armas 2000, 2005, Weygoldt 2007), others compiled revisions of particular groups (Kraepelin 1895, Mullin 1975, Garcia Acosta 1977, Quintero 1981, Weygoldt 1999, Rahmadi et al. 2011). In recent years the need for taxo-

nomic data has increased because scientists have described numerous new species (Harvey & West 1998, de Armas & Teruel 2010, Rahmadi et al. 2010, 2011, de Armas 2012, Giupponi & Miranda 2012). For this reason it is necessary to know where the type material, and other specimens needed for comparison, are located. For the first time, precise data are here made available for the whip spiders in the collection of the Natural History Museum Vienna (NHMW).

Material and methods

The collection of Amblypygi (Arachnida) in the Natural History Museum Vienna (NHMW) was revised between April and June 2011. Acquisition (Fig. 1) and inventory books, as well as datasheets, were screened. A stereomicroscope (Wild/Leica M3Z) was used to investigate the specimens and photos were made with a Nikon DSII camera. The identity of specimens was verified in some cases and labels – if necessary – renewed. The labels usually include the name of the species, the date of collection and the location. Furthermore, the name of the collector and/or donator, the name of the person who determined the specimen (sometimes also the date of determination), the acquisition number and the inventory number are given (see Fig. 2). In many cases the sex had not been determined. This lack of information was tolerated to protect the structures of the genital operculum and surround-

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IV. Dr. Scherzer leg.		1871.
1. <i>Diplocentrus Whitei</i> (Gerv.)	Centralamerika	3
2. <i>Centronus Hemprichii</i> (Gerv.)	"	1
3. <i>Centronus Degeeri</i> (Gerv.)	"	5
4. <i>Centronus gracilis</i> (Latr.)	"	1
5. <i>Neophrynus marginemaculatus</i> (Koch)	"	1
6. <i>Neophrynus palmatus</i> (Herbst)	"	1
7. <i>Neophrynus Whitei</i> (Gerv.)	"	1
8. <i>Cynorta Roelpelii</i> W.S.	Grenada	3
9. <i>Scodes</i>	Central. Amerika	2
10. <i>Scodes</i>	"	8

Fig. 1: Extract from the acquisition book with the record (1871.IV) of the oldest amblypygi. Numbers 5–7: *Neophrynus* spp. from "Central America". *Neophrynus marginemaculatus* has been transferred to *Phrynus marginemaculatus* C.L. Koch, 1840; *Neophrynus palmatus* has been transferred to *Phrynus barbadensis* (Pocock, 1894); *Neophrynus whitei* has been transferred to *Phrynus asperatipes* Wood, 1863.

ing areas. Most of the material is in good condition and can be used for scientific studies. All specimens, with a few exceptions that have been conserved dry, are stored in 70 % ethanol (denatured). Some material

might have been influenced by formalin at an earlier date, but no detailed information is available about this. Nomenclature follows Harvey (2003, 2013), since these works include the last complete listings.

<p>Coll. Musei Vindobonensis Arachn. Inv. No. 1440</p> <p><i>Damon brachialis</i> WEYGOLDT, 1999</p> <p>"Afrika: Zambese" - vermutlich: MOZAMBIQUE: Umgebung von Boroma, leg. P. MENYHARTH S.J. (MENYHARDT?) ca. Ende des 19. Jhdts.- Dr. Karl BRANCSIK don.- (det. ?Kraepelin sub <i>Damon variegatus</i>) revid. P. WEYGOLDT:</p> <p>T. d. (1871) (1875)</p>	<p>Coll. Musei Vindobonensis Arachnoidea Inv. No. 1446</p> <p><i>Paraphrynus mexicanus</i> (BILIMEK)</p> <p>MEXICO: Grotte Cacahuamilpa. BILIMEK leg.</p> <p>D. QUINTERO rev.: 2006</p> <p>(SYNTYPE IV!)</p> <p>A.-No. 1233 II-2.</p>
<p>Coll. Musei Vindobonensis Arachn. Inv. No. 1448</p> <p><i>Tarantula marginemaculata</i> subsp. <i>yucatanensis</i> WERNER</p> <p>Belize, Yucatan. Coll. SCHMARDA. (as <i>Diplocentrus</i> - anal. Sammlg. d. Univ. Wien) WERNER St. 1102: TYPUS</p> <p>1</p>	<p>Coll. Musei Vindobonensis Arachn. Inv. No. 1427</p> <p><i>Lindosiella ioannitica</i> KRITSCHER</p> <p>Rhodos: Lindos, 15./16. IV. 1959</p> <p>leg. & det. E. KRITSCHER: 8 Ex (TYPEN)</p>

Fig. 2: Typical labels in the collection of arachnids at the NHMW using the labels of the four type specimens of Amblypygi.



Fig. 3: Female of *Charinus ioanniticus* (Rhodes, found in subterranean passages of the ancient city of Rhodes and photographed alive in a standard plastic terrarium by M. Seiter)

List of abbreviations: BMNH: British Museum (Natural History) in London, NHMW: Natural History Museum Vienna, sp.: species, leg. = legit (collected), det. = determinavit (determined), don. = (donated), ♂ = male / ♀ = female, ♂♂ = males / ♀♀ = females, HT = Holotype, LT = Lectotype, ST = Syntype

Results

The oldest parts of the Arachnoidea collection itself may date back to the early 19th century; the oldest Amblypygi dates from 1871 (see Fig. 1). The curators responsible for the collection of arachnids, starting in 1878, were Carl Koelbel, Theodor Adensamer, Arnold Penther, Carl Attems, Otto Pesta, Eduard Reimoser, Hans Strouhal, Gerhard Pretzmann, Jürgen Gruber, Verena Stagl (for the collection history see Pesta 1940) and, today, the second author of this paper: Christoph Hörweg.

For whip spiders, relevant collectors/donators in former times were Theodor Adensamer, Dominik Bilimek and Eduard Reimoser (see Pesta 1940), and more recently Helmut Sattmann. Most of the material originated from Sri Lanka (as Ceylon), Mexico, Rhodes (Greece) and Oman. The specimens in the collection were formerly revised by Quintero in 1980 and Weygoldt in 1996 and 1998. Today, the whip spider collection holds a total of 167 specimens, including 27 species in 10 genera and 4 families (Tab. 1). It includes types of 4 species. Supplementary information about these species will be given below.

Type specimens

Charinidae Quintero, 1986

Charinus ioanniticus (Kritscher, 1959) (syntypes)
= *Lindosiella ioannitica* Kritscher, 1959 (syn. by Weygoldt 1972)

Tab. 1: Species list of the Amblypygi collection at the NHMW. Nomenclature follows Harvey (2003, 2013).

Taxa	Inventory Number NHMW
Charontidae (1)	
<i>Charon grayi</i> (Gervais, 1842)	1426, 21841
Phrynichidae (14)	
<i>Euphrynichus amanica</i> (Werner, 1916)	9289
<i>Euphrynichus bacillifer</i> (Gerstaecker, 1873)	1428, 1429, 9279, 9280, 18731
<i>Trichodamon princeps</i> Mello-Leitão, 1935	21842
<i>Phrynichus ceylonicus</i> (C.L.Koch, 1843)	1431-1434, 1436, 1437, 1442, 11198, 15414, 21843
<i>Phrynichus deflersi</i> Simon, 1887	18221, 18222
<i>Phrynichus exophthalmus</i> Whittick, 1940	1430, 9290
<i>Phrynichus jayakari</i> Pocock, 1894	20930
<i>Phrynichus pusillus</i> Pocock, 1894	15415
<i>Phrynichus scaber</i> (Gervais, 1844)	1435
<i>Damon annulatipes</i> (Wood, 1869)	18241-18248
<i>Damon brachialis</i> Weygoldt, 1999	1440
<i>Damon diadema</i> (Simon, 1876)	9282, 9291, 19535
<i>Damon medius</i> (Herbst, 1797)	1438, 1441, 9281
<i>Damon variegatus</i> (Perty, 1834)	1439
Phrynidae (10)	
<i>Acanthophrynus coronatus</i> (Butler, 1873)	1444, 1450
<i>Heterophrynus longicornis</i> (Butler, 1873)	1443
<i>Phrynus asperatipes</i> Wood, 1863	1851
<i>Phrynus gervaisii</i> (Pocock, 1894)	9285, 9286, 21844, 21845
<i>Phrynus parvulus</i> (Pocock, 1902)	1448, 9287, 21846
<i>Phrynus tessellatus</i> (Pocock, 1894)	1449
<i>Phrynus whitei</i> Gervais, 1842	1452, 9283, 9284
<i>Paraphrynus laevifrons</i> (Pocock, 1894)	1453, 9288, 21847-21849
<i>Paraphrynus mexicanus</i> (Bilimek, 1867)	1446, 1447
<i>Paraphrynus pococki</i> Mullinex, 1975	1445
Charinidae (2)	
<i>Charinus australianus cavernicolus</i> Weygoldt, 2006	21850
<i>Charinus ioanniticus</i> (Kritscher, 1959)	1427, 19137-19140, 21167

This species was described by Kritscher 1959 as *Lindosiella ioannitica*, not only as a new species, but also within a new genus.

Location: GREECE, Island of Rhodes, City of Lindos. Found in crevices at the base and fundament of the so-called Johanniterburg, on 15th and 16th April 1959, leg. & det. Erich Kritscher

Inventory Number: NHMW 1427, 1♂ (as mentioned in the original description), 3♀♀ and 4♀♀ juveniles (=ST)

Remarks: In the original description, 8 specimens were mentioned, but there are in fact 9, including one prepared and positioned in the exhibition in the collection. The one in the exhibition is labelled as “Coty-

pus”. This specimen can’t be examined without being destroyed. In any case, it should be mentioned that Weygoldt (2005) recorded only 7 females (he examined the specimens in the collection, but obviously not the one from the exhibition and another one). As no holotype was designated in the original description, all specimens have to be considered as syntypes.

Charinus ioanniticus (Fig. 3) is distributed around parts of the eastern border of the Mediterranean (see below). The only European populations are located on the Greek islands of Rhodes and Kos (Kritscher 1959, Weygoldt 2005). Interestingly, the population on Rhodes is an all-female population that reproduces parthenogenetically (Weygoldt 2007). Here they

live in subterranean passages of the ancient city of Rhodes (a cave-like lifestyle) (Weygoldt 2005). This form of reproduction is very rare in whip spiders. It is known only in *Charinus acosta* (Quintero, 1983) (de Armas 2000, 2005) from Cuba. *C. ioanniticus* has also been reported from Turkey (Kovářík & Vlasta 1996, Weygoldt 2005, Seyyar & Demir 2007), Israel (Rosin & Shulov 1960) and Egypt (El-Hennawy 2002), but these populations all reproduce sexually.

Phrynichidae Simon, 1892

Damon brachialis Weygoldt, 1999 (holotype)

This species was described by Weygoldt (1999) in his revision of the genus *Damon*.

Location: MOZAMBIQUE. Surroundings of Boroma, “Afrika: Zambese”, from the late 19th century, leg. P. Menyhardt, don. Dr. Karl Brancsik, det. Peter Weygoldt
Inventory number: NHMW 1440, 1♂ (= HT)

Remarks: This specimen was initially determined (most likely by Kraepelin) as *Damon variegatus* (Perty, 1834) (see Fig. 2).

Phrynidae Blanchard, 1852

Phrynus parvulus (Pocock, 1902) (lectotype)

= *Tarantula marginemaculata yucatanensis* Werner, 1902 (syn. by Quintero 1981)

This specimen was revised and synonymised by Quintero (1981) in his overview of the amblypygid genus *Phrynus* in the Americas.

Location: BELIZE. Jukatan, 1902, leg. Schmarda & Werner

Inventory number: NHMW 1448, 1♂ (LT)

Remarks: Quintero (1981) mentions two male holotypes, one of *Phrynus parvulus* (Pocock 1902), with type locality in Tikal, Guatemala (specimen examined from BMNH), and this particular specimen from the NHMW, with type locality in Belize.

We consider this specimen as lectotype by inference of holotype by Quintero (1981), according to ICZN Art. 74.6.

Paraphrynus mexicanus (Bilimek, 1867) (syntypes)

= *Phrynus mexicanus* Bilimek, 1867 (transferred after Mullinex 1975)

= *Phrynus cacahuamilpensis* Herrera, 1892 (syn. by Garcia Acosta 1977)

These specimens were described by Bilimek (1867) as *Phrynus mexicanus*.

Location: In the cave Cacahuamilpa in Mexico sitting on rocks, 14.1.1866, leg. Bilimek, det. Kraepelin.

Inventory number: NHMW 1446, 2mm (ST)

Remarks: Another juvenile specimen was found several days later at the same locality (NHMW 1447). In the original description, however, only two adult males are mentioned.

Checklist of the collection

The complete species list of the Amblypygi collection at the NHMW is summarized in Tab. 1.

Conclusions

The whip spider collection of the NHMW – with 167 specimens from 27 species – is considered to be a small one. Nonetheless, approx. 15% of the valid species of the world are deposited in the museum, and the collection has types of 4 species.

Note that the whip spider *Charinus ioanniticus* made it – as “object No. 59”, titled “European Premiere” – into the book Top 100 of the NHMW (Ott et al. 2012). It states: “As until the middle of the 20th century there was no indication that this group of spiders existed at all in Europe. When arachnologist Erich Kraitsirer discovered this sample of a new species hiding in a crack in the wall at the Castle of the Knights of St. John in Lindos in 1959, it was truly sensational news”. Interesting is also the comment on one (juvenile) specimen of *Charinus ioanniticus* (NHMW 1939) which was found dead in the spider net of *Pholcus* sp. (“von *Pholcus* gefesselt”).

We would also like to point out one fact that can cause taxonomic problems, using *Trichodamon princeps* Mello-Leitão, 1935 (NHMW 21842) as an example: The right basitibia of leg IV is not divided, but it is a principal character of this genus that it should be divided. All other morphological characters (two small tubercles above the cleaning organ on pedipalp distitarsus, ventral tibial spine I not bifid, etc.) are correct. This ‘non-divided’ part is caused by a formerly broken leg which was regenerated over several molts. As this is not uncommon in Amblypygi, it is worth mentioning here.

Note that many of the species mentioned here are being captive bred and are available for scientific research – see Appendix. Contact the first author for further information.

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Appendix

Checklist of the personal collection of Michael Seiter (as of 21.09.2013)

* means that from this species, individuals from more than one locality are available

Charontidae (1)

Charon cf. *grayi* (Gervais, 1842)*

Phrynichidae (12)

Damon annulatipes (Wood, 1869)

Damon diadema (Simon, 1876)

Damon medius (Herbst, 1797)*

Damon tibialis (Simon, 1876)

Damon variegatus (Perty, 1834)

Euphrynichus amanica (Werner, 1916)

Euphrynichus bacillifer (Gerstaecker, 1873)

Phrynichus ceylonicus (C.L. Koch, 1843)

Phrynichus deflersi arabicus Simon, 1887

Phrynichus exophthalmus Whittick, 1940

Phrynichus jayakari Pocock, 1894

Phrynichus orientalis Weygoldt, 1998

Phrynidae (30)

Acanthophrynus coronatus (Butler, 1873)

Heterophrynus batesii (Butler, 1873)

Heterophrynus cf. *elaphus* Pocock, 1903

Paraphrynus aztecus (Pocock, 1894)

Paraphrynus carolynae Armas, 2012

Paraphrynus cubensis (Quintero, 1983)*

Paraphrynus emaciatus Mullinex, 1975

Paraphrynus laevifrons (Pocock, 1894)

Paraphrynus mexicanus (Bilimek, 1867)

Paraphrynus raptator (Pocock, 1902)

Paraphrynus robustus (Franganillo, 1930)*

Paraphrynus sp. (from Mexico)

Paraphrynus viridiceps (Pocock, 1893)*

Phrynus asperatipes Wood, 1863

Phrynus barbadensis (Pocock, 1894)*

Phrynus damonidaensis Quintero, 1981*

Phrynus decorates Teruel & Armas, 2005*

Phrynus eucharis Armas & Pérez, 2002

Phrynus exsul Harvey, 2002

Phrynus garridoi Armas, 1994

Phrynus goesii Thorell, 1889*

Phrynus hispaniolae Armas & González, 2002*

Phrynus longipes (Pocock, 1894)*

Phrynus marginemaculatus (C.L. Koch, 1840)*

Phrynus noeli Armas & Pérez, 1994

Phrynus pulchripes (Pocock, 1894)

Phrynus sp. (from Dominican Republic)

Phrynus operculatus Pocock, 1902

Phrynus pinarensis Franganillo, 1930*

Phrynus whitei Gervais, 1842*

Charinidae (15)

Charinus acosta (Quintero, 1983)*

Charinus australianus cavernicolus Weygoldt, 2006

Charinus centralis Armas & Ávila Calvo, 2000*

Charinus cubensis (Quintero, 1983)*

Charinus ioanniticus (Kritscher, 1959)

Charinus neocaledonicus Simon, 1895

Charinus tomasmicheli Armas, 2007

Charinus wanlessi (Quintero, 1983)

Sarax brachydactylus Simon, 1892

Sarax buxtoni (Gravely, 1915)

Sarax singapora Gravely, 1911

Sarax sp. (from Indonesia, Bali)

Sarax sp. (from Indonesia, Lombok)

Sarax sp. (from Philippines)

Sarax yayukae Rahmadi, Harvey & Kojima, 2010